PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference DDG-001 PCT	FOR FURTHER ACTION	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
International application No. PCT/US03/35187	International filing date *(day/month/year)* 05 November 2003 (05.11.2003)	Priority date *(day/month/year)* 08 November 2002 (08.11.2002)
International Patent Classification (IPC) or national classification and IPC IPC(7): B32B 27/04,27/38,31/06,31/16,31/26; A47G 01/12,35/00 and US Cl.: 428/13,38,98,220,221,295.1,297.4,320.2,322.2,413,414,415,416,417,418,542.2,542.4,542.6,913.3		
Applicant GRAY, DYAN		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 6 sheets, including this cover sheet.

   ☒ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

   These annexes consist of a total of 2 sheets.

3. This report contains indications relating to the following items:

   - I ☒ Basis of the report
   - II ☐ Priority
   - III ☐ Non-establishment of report with regard to novelty, inventive step and industrial applicability
   - IV ☐ Lack of unity of invention
   - V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
   - VI ☐ Certain documents cited
   - VII ☐ Certain defects in the international application
   - VIII ☐ Certain observations on the international application

Date of submission of the demand	Date of completion of this report
26 May 2004 (26.05.2004)	22 April 2005 (22.04.2005)
Name and mailing address of the IPEA/US Mail Stop PCT, Attn: IPEA/ US Commissioner for Patents P.O. Box 1450 Alexandria, Virginia 22313-1450 Facsimile No. (703) 305-3230	Authorized officer Michael J. Feely Telephone No. 571-272-1700

Form PCT/IPEA/409 (cover sheet)(July 1998)

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International [redacted]cation No.
PCT/US03/35187

I. Basis of the report

1. With regard to the elements of the international application:*

☐ the international application as originally filed.

☒ the description:
pages 1-11 as originally filed
pages NONE , filed with the demand
pages NONE , filed with the letter of _____.

☒ the claims:
pages 12-15 , as originally filed
pages NONE , as amended (together with any statement) under Article 19
pages NONE , filed with the demand
pages 16-21 , filed with the letter of 27 October 2004 (27.10.2004)

☒ the drawings:
pages 1-6 , as originally filed
pages NONE , filed with the demand
pages NONE , filed with the letter of _____.

☐ the sequence listing part of the description:
pages NONE , as originally filed
pages NONE , filed with the demand
pages NONE , filed with the letter of _____.

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.
These elements were available or furnished to this Authority in the following language _____ which is:

☐ the language of a translation furnished for the purposes of international search (under Rule23.1(b)).

☐ the language of publication of the international application (under Rule 48.3(b)).

☐ the language of the translation furnished for the purposes of international preliminary examination(under Rules 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

☐ contained in the international application in printed form.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority in written form.

☐ furnished subsequently to this Authority in computer readable form.

☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. ☒ The amendments have resulted in the cancellation of:

☒ the description, pages None

☒ the claims, Nos. None

☒ the drawings, sheets/~~fig~~ None

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).**

** Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17).*
*** Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.*

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International [redacted]ation No.
PCT/US03/35187

V. Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. STATEMENT

Novelty (N)	Claims	1-18,20,22-26,30,35,38	YES
	Claims	19,21,27-29,31-34,36,37,39	NO
Inventive Step (IS)	Claims	1-18,22-26,30,35,38	YES
	Claims	19-21,27-29,31-34,36,37,39	NO
Industrial Applicability (IA)	Claims	1-39	YES
	Claims	NONE	NO

2. CITATIONS AND EXPLANATIONS
Please See Continuation Sheet

Supplemental Box
(To be used when the space in any of the preceding boxes is not sufficient)

V. 2. Citations and Explanations:

1. Claims 19, 21, 27-29, 31, 32, and 39 lack novelty under PCT Article 33(2) as being anticipated by Barnette (US Pat. No. 3,328,499).

Regarding claims 19, 21, and 32, Barnette discloses: *(19)* a method of manufacturing a composite material (column 2, line 10 through column 3, line 60), comprising:
a) first pouring a mixture of a base portion and a reactor portion of an epoxy resin into a mold to form a first layer of the resin (column 2, lines 10-21; column 2, line 25 through column 3, line 4);
b) allowing the first layer to at least partially cure (column 2, line 25 through column 3, line 4);
c) adding a plurality of decorative elements onto the at least partially cured first layer, wherein the decorative elements includes at least one of stones, pebbles, clay, rock, sand, gravel, dye, pigment, clay, wood, powder, paints, paint chips, pigment, beads, marbles, glass, glow-in-the dark materials, mulch, liquids, photographs, mesh, and figurative objects, and wherein no discrete decorative element covers the entirety of the first layer (column 2, line 25 through column 3, line 4);
d) second pouring a mixture of the base portion and the reactor portion of the epoxy resin into the mold to form a second layer of the resin over the first layer (column 3, lines 19-60); and
e) allowing the second layer to cure (column 3, lines 19-60);
(21) further comprising providing decorative elements into the first layer (column 2, line 25 through column 3, line 4); and
(32) further comprising removing the cured resin from the mold (column 3, lines 19-60).

Regarding claims 27-29 and 31, Barnette discloses: *(27)* a method of manufacturing a composite material (column 2, line 10 through column 3, line 60), comprising:
a) first pouring a mixture of a base portion and a reactor portion of an epoxy resin into a mold to form a first layer of the resin (column 2, lines 10-21; column 2, line 25 through column 3, line 4);
b) first providing a plurality of decorative elements into the first layer (column 2, line 25 through column 3, line 4);
c) at least partially curing the first layer (column 2, line 25 through column 3, line 4);
d) second pouring a second mixture of the base portion and the reactor portion of the epoxy resin into the mold to form a second layer of the resin over the first layer (column 3, lines 19-60); and
e) allowing the second layer to cure (column 3, line 19-60);
(28) wherein said providing a plurality of decorative elements includes one of, i) mixing the decorative element into the mixture prior to said pouring, and ii) adding the decorative element to the layer after said pouring (column 2, line 25 through column 3, line 4);
(29) further comprising removing the cured resin from the mold (column 3, line 19-60); and
(31) further comprising second providing a decorative element onto the first layer after at least partially curing the fist layer (column 2, line 25 through column 3, line 4).

Regarding claim 39, Barnette discloses: *(39)* a method of manufacturing a composite material (column 2, line 10 through

Supplemental Box
(To be used when the space in any of the preceding boxes is not sufficient)

column 3, line 60), comprising:
a) first pouring a mixture of a base portion and a reactor portion of an epoxy resin into a mold to form a first layer of the resin (column 2, lines 10-21; column 2, line 25 through column 3, line 4);
b) allowing the first layer to at least partially cure (column 2, line 25 through column 3, line 4);
c) adding a decorative element onto the at least partially cured first layer, wherein the decorative elements includes at least one of stones, pebbles, clay, rock, sand, gravel, dye, pigment, clay, wood, powder, paints, paint chips, pigment, beads, marbles, glass, glow-in-the dark materials, mulch, liquids, photographs, mesh, and figurative objects (column 2, line 25 through column 3, line 4);
d) second pouring a mixture of the base portion and the reactor portion of the epoxy resin into the mold to form a second layer of the resin over the first layer (column 3, lines 19-60); and
e) allowing the second layer to cure (column 3, lines 19-60); and
f) removing the cured resin from the mold (column 3, lines 19-60).

2. Claims 33, 34, 36, and 37 lack novelty under PCT Article 33(2) as being anticipated by Piekos (US Pat. No. 5,759,658).
Regarding claims 33 and 34, Piekos discloses: ***(33)*** an epoxy resin composite material (Abstract; column 3, line 30 through column 4, line 62), comprising:
a) a first layer of an epoxy resin molded in a form so as to have an upper generally planar front surface with a length and height (column 4, lines 24-44);
b) a plurality of decorative elements of a first size dispersed within said first layer resin, each of said decorative elements having a length and height substantially smaller than said first layer (column 3, line 47 through column 4, line 44);
c) a second layer of an epoxy resin coupled to said first layer and forming a back surface of said material (column 4, lines 24-62);
d) a plurality of decorative elements of a second size dispersed within said second layer resin, said second size being smaller than said first size (column 3, line 47 through column 4, line 44),
wherein said first layer is sufficiently transparent such that said decorative elements in said second layer are visible therethrough (Abstract; column 3, line 30 through column 4, line 62); and
(34) wherein said decorative elements of said second size are even dispersed throughout said second layer (column 3, line 47 through column 4, line 62).

Regarding claims 36 and 37, Piekos discloses: ***(36)*** an epoxy resin composite material (Abstract; column 3, line 30 through column 4, line 62), comprising:
a) a first layer of an epoxy resin molded in a form so as to have an upper generally planar front surface with a length and height (column 4, lines 24-44);
b) a plurality of first decorative elements of a first size dispersed within said first layer resin, each of said decorative elements having a length and height substantially smaller than said first layer (column 3, line 47 through column 4, line 44);
c) a second layer of an epoxy resin coupled to said first layer and forming a back surface of said material (column 4, lines 24-62);
d) a second decorative element mixed within said second layer resin, (column 3, line 47 through column 4, line 44),
wherein said first layer is sufficiently transparent such that said decorative element in said second layer is visible therethrough (Abstract; column 3, line 30 through column 4, line 62); and
(37) wherein said decorative element is evenly dispersed within said second layer (column 3, line 47 through column 4, line 62).

3. Claim 20 lacks an inventive step under PCT Article 33(3) as being obvious over Barnette (US Pat. No. 3,328,499).
Barnette does not explicitly teach a preferable curing time of 6 to 24 hours; however, optimization of such a parameter would have been within the ordinary skill of the artisan at the time of the invention.

4. Claims 1-18, 22-26, 30, 35, and 38 meet the criteria set out in PCT Article 33(2)-(3), because the prior art does not teach or fairly suggest:

Claims 1-10: are drawn to a transparent composite comprising:
a) and epoxy resin formed from: a base portion comprising (i) a polymer of epichlorohydrin and bisphenol A, and (ii) alkyl glycidyl ether; and a reactor portion comprising (i) aromatic alcohol, (ii) benzoic acid, 2 hydroxy, (iii) cycloaliphatic diamine, (iv) phenol-nonyl, and (v) polymer of epichlorohydrin and bisphenol A; and
b) decorative elements dispersed within said resin.
Claims 11-18: are drawn to an article comprising the composite set forth in claim 1.
Sikorski (US Pat. No. 6,357,103), Herrndobler (US Pat. No. 5,619,814), Barnette (US Pat. No. 3,328,499), and Piekos (US Pat. No. 5,759,658) disclose composites which are structurally similar; however, none of these references use the specified composition. Firth (US Pat. No. 4,360,456) discloses a similar composition *(see column 2, line 29 through column 3, line 41)*; however, there is no motivation to combine this composition with the decorative articles set forth in Sikorski, Herrndobler, Barnette, and Piekos. Hartman et al. (US Pat. No. 5,962,602) also teach a similar epoxy composition *(see column 3-4)*; however, they fail to teach the specific composite structure of the instant invention. Furthermore, there is no motivation to combine this composition with the decorative articles set forth in Sikorski, Herrndobler, Barnette, and Piekos.

Supplemental Box
(To be used when the space in any of the preceding boxes is not sufficient)

Claim 22 and 23: further provide a third epoxy layer in the method of claim 19.
Barnette (US Pat. No. 3,328,499) fails to teach or suggest the provision of a third epoxy layer.

Claim 24: further includes the step of sanding the first layer prior to adding the plurality of decorative elements onto the at least partially cured first layer.
Barnette (US Pat. No. 3,328,499) fails to teach or suggest a sanding step.

Claims 25 and 26: limit the method claim 19 to the use of the reactor system set forth in claim 1;
Claim 30: limits the method of claim 27 to the use of the reactor system set forth in claim 1.
Firth (US Pat. No. 4,360,456) and Hartman et al. (US Pat. No. 5,962,602) disclose similar compositions; however, there is no motivation to combine these compositions with the method set forth in Barnette (US Pat. No. 3,328,499).

Claim 35: further provides an intervening epoxy resin layer between said first and second layers in the composite material of claim 33.
Claim 38: further provides an intervening epoxy resin layer between said first and second layers in the composite material of claim 36.
Piekos (US Pat. No. 5,759,658) uses an intervening layer made from a fabric or mesh material. They fail to teach or suggest the presence of an intervening epoxy resin layer.

5. Claims 1-31 meet the criteria set out in PCT Article 33(4), and thus have industrial applicability because the subject matter claimed can be made or used in industry.

---------- NEW CITATIONS ----------
US 3,328,499 (BARNETTE) 27 June 1967, see columns 2-3.

US 5,759,658 (PIEKOS) 02 June 1998, see columns 3-4.

US 5,962,602 (HARTMAN et al) 05 October 1999, see columns 3-4.

19. A method of manufacturing a composite material, comprising:

a) first pouring a mixture of a base portion and a reactor portion of an epoxy resin into a mold to form a first layer of the resin;

b) allowing the first layer to at least partially cure;

c) adding a decorative element onto the at least partially cured first layer, wherein the decorative element includes at least one of stones, pebbles, clay, rock, sand, gravel, dye, pigment, clay, wood, powder, paints, paint chips, pigment, beads, marbles, glass, glow-in-the dark materials, mulch, liquids, photographs, mesh, and figurative objects;

d) second pouring a mixture of the base portion and the reactor portion of the epoxy resin into the mold to form a second layer of the resin over the first layer; and

e) allowing the second layer to cure.

20. A method according to claim 19, wherein:

said allowing the first layer to at least partially cure includes curing for preferably six to twenty four hours.

21. A method according to claim 19, further comprising:

providing decorative elements into the first layer.

22. A method according to claim 19, further comprising:

after the second layer is partially cured, third pouring a mixture of the base portion and the reactor portion of the epoxy resin into the mold to form a third layer of the resin over the second layer.

23. A method according to claim 22, further comprising:

providing decorative elements in the third layer.

24. A method according to claim 19, further comprising:

prior to adding the decorative element onto the at least partially cured first layer, sanding the first layer.

25. A method according to claim 19, wherein:

the reactor portion comprises,

(i) aromatic alcohol,

(ii) benzoic acid, 2 hydroxy,

(iii) cycloaliphatic diamine,

(iv) phenol-nonyl,

(v) polymer of epichlorohydrin and bisphenol A.

26. A method according to claim 25, wherein:

the reactor portion comprises,

(i) 15-35 wt% aromatic alcohol,

(ii) 3-10 wt% benzoic acid, 2 hydroxy,

(iii) 35-65 wt% cycloaliphatic diamine,

(iv) 4-15 wt% phenol-nonyl,

(v) 1-2 wt% polymer of epichlorohydrin and bisphenol A.

27. A method of manufacturing a composite material, comprising:

a) first pouring a mixture of a base portion and a reactor portion of an epoxy resin into a mold to form a first layer of the resin;

b) first providing a decorative element into the first layer;

c) at least partially curing the first layer;

d) second pouring a mixture of the base portion and the reactor portion of the epoxy resin into the mold to form a second layer of the resin over the first layer; and

e) allowing the second layer to cure.

28. A method according to claim 27, wherein:

said providing a decorative element includes one of,

i) mixing the decorative element into the mixture prior to said pouring, and

ii) adding the decorative element to the layer after said pouring.

29. A method according to claim 27, further comprising:

removing the cured resin from the mold.

30. A method according to claim 27, wherein:

the mixture includes a reactor portion comprising,

(i) 15-35 wt% aromatic alcohol,

(ii) 3-10 wt% benzoic acid, 2 hydroxy,

(iii) 35-65 wt% cycloaliphatic diamine,

(iv) 4-15 wt% phenol-nonyl,

(v) 1-2 wt% polymer of epichlorohydrin and bisphenol A,

wherein the base portion and reactor portion are provided in a two to one ratio.

31. A method according to claim 27, further comprising:

second providing a decorative element onto the first layer after at least partially curing the first layer.